

REPLACED BY
ART 34 AMDT

PATENT CLAIMS

1. Procedure for combating microorganisms in a sugary, aqueous process medium, in particular of the sugar industry inserting hops acid as the active substance,
characterized by the fact that
hops acid in an aqueous alkaline medium is added in solution to the process medium, whereby the pH value of the added solution is higher than the pH value of the process medium; the hops acid in the process medium passes over from the dissociated form into the non-dissociated form.
2. Procedure according to one of the foregoing claims, **[t..n.: sic]**
characterized by the fact that
the addition of the solution to the process medium is done in discontinuous manner.
3. Procedure according to Claim 1 or 2,
characterized by the fact that
the solution displays hops acid in a concentration of 2 – 40%, preferably 5- 20%, preferably 10 – 15%.
4. Procedure according to one of the foregoing claims,
characterized by the fact that
the solution added to the process medium displays a pH value of 7.0 – 13.0, preferably 7.5 – 12.0, preferably 9.5 – 11.0.
5. Procedure according to one of the foregoing claims,
characterized by the fact that
being dealt with – at least predominantly – in the case of hops acid is β -acid.
6. Procedure according to one of Claims 1 –4,
characterized by the fact that
being dealt with – at least predominantly – in the case of hops acid is α -acid and or iso- α -acid.

7. Procedure according to one of Claims 1-6,
characterized by the fact that
in the case of the hops acid being dealt with – at least predominantly – is isomerized hops acid and/or its derivatives, or in any event a mixture thereof.
8. Procedure according to Claim 7,
characterized by the fact that
in the case of the derivatives being dealt with – at least predominantly – are tetrahydro α -acid (THAA) or hexahydro- β -acid (HHBA), and in the case of the hops acid derivatives are iso- α -acid (IAA), rho-iso- α -acid (RIAA), tetrahydro-iso- α -acid (THIAA) and/or hexahydro-iso- α -acid, or in any event mixtures thereof.
9. Procedure according to one of the foregoing claims,
characterized by the fact that
provided as an alkaline medium is an alkaline hydroxide, in particular potassium hydroxide or sodium hydroxide, or a mixture thereof.
10. Procedure according to Claim 9,
characterized by the fact that
the concentration of the alkaline medium amounts to 0.1 - 5%, preferably 1 –5% preferably 2 – 4% alkaline hydroxide.
11. Procedure according to Claim 1,
characterized by the fact that
besides the addition of the solution, supplied to the process medium is additionally alkaline lye.
12. Procedure according to one of the foregoing claims,
characterized by the fact that
the hops acid is dissolved in the alkaline medium as salt.
13. Procedure according to one of the foregoing claims,
characterized by the fact that
the solution is added to the process medium manually.

14. Procedure according to one of the foregoing claims 1 –12,
characterized by the fact that
the solution is added to the process medium over already available dosing systems.
15. Procedure for the production of a solution of hops acid for addition to a sugary, aqueous process medium, in particular of the sugar industry according to the procedure based on the foregoing claims 1 – 14,
the following procedural steps comprising:
- a) preparation of an aqueous medium;
 - b) heating;
 - c) addition of hops acid, in particular melted hops acid, measuring the amount of hops acid such that the end concentration lies within a prescribed concentration range;
 - d) addition of the alkaline medium for reaching a predetermined pH value;
 - e) mixing the alkaline medium with the added-in hops acid;
 - f) maintaining the mixture at an elevated temperature over a prescribed period of time;
 - g) separating out the hops acid solution from the mixture or vice-versa, as well as
 - h) cooling the hops acid solution.
16. Procedure according to Claim 15,
characterized by the fact that
the concentration of the hops acid in solution lies in the range of 2 – 40%, preferably 5 – 20%, especially preferred 10 – 15%.
17. Procedure according to Claim 15 or 16,
characterized by the fact that
the mixture is held at a temperature in the range of 40 – 80° C, preferably 60 – 80° C, preferably 65 – 75° C.
18. Procedure according to the foregoing claims 15 – 17,
characterized by the fact that
hops acid solution is cooled down to a temperature below 10° C, preferably to a temperature in a range from 2 – 7° C.

19. Procedure according to one of the foregoing Claims 15 – 18,
characterized by the fact that
the separated out solution of hops acid displays a pH value in the range of 7.0 – 13.0,
preferably 7.5 – 12.0, preferably 9.5 – 11.0.
20. Procedure according to one of the foregoing claims 15 – 19,
characterized by the fact that
used as hops acids are β -acids, α -acids, iso- α -acids or a mixture thereof, or isomerized
hops acids and/or their derivatives, in particular –at least predominantly – tetrahydro- α -acid
(THAA) or hexahydro- β -acid (HHBA) or iso- α -acid (IAA), rho-iso- α -acid (RIAA), tetrahydro-
iso- α -acid (THIAA) and/or hexahydroxide-iso- α -acid, or a mixture thereof.
21. Use of hops acids for combating microorganisms in a sugary, aqueous process medium, in
particular of the sugar industry,
characterized by the fact that
hops acid brought into an alkaline solution is added to the process medium, whereby the
pH value of the solution is higher than the pH value of the process medium, and the hops
acid in the process medium passes over from the dissociated form into the non-dissociated
form based on one of the Claims 1 – 14.